

CLAIMS

1-20. (Cancelled)

21. (Currently Amended) A multistage differential amplifier, comprising:

~~(a)~~—a first amplifier stage, ~~said the~~ first amplifier stage including:

(i)—a first differential pair of input transistors with loads coupled to a supply voltage through a first common-mode transistor; and

(ii)—a first pair of emitter-follower output transistors coupled to ~~said the~~ first differential pair of input transistors;

~~(b)~~—a second amplifier stage, ~~said the~~ second amplifier stage including:

(i)—a second differential pair of input transistors with loads coupled to ~~said the~~ supply voltage through a second common-mode transistors; and

(ii)—a second pair of emitter-follower output transistors coupled to ~~said the~~ second differential pair of input transistors, wherein ~~said the~~ second differential pair of input transistors is coupled to ~~said the~~ first pair of emitter-follower output transistors; and

~~(c)~~—a voltage regulator coupled to control ~~said the~~ first common-mode transistor, ~~said the~~ voltage regulator including:

(i)—a differential amplifier with a first input from a reference voltage, a second input from a temperature responsive unit, and an output to a third transistor connected between a supply voltage and ~~said the~~ temperature responsive unit; and

(ii)—a regulated voltage output ~~locus node~~ between ~~said the~~ third transistor and ~~said the~~ temperature responsive unit, wherein ~~said the~~ temperature responsive unit includes in series a first resistor, a second resistor, and a diode-connected transistor having a voltage-temperature response similar to that of each of the first pair of emitter-follower output transistors in the first amplifier stage.

22. (Currently Amended) The amplifier of claim 21, wherein ~~(i) said the~~ first resistor is between ~~said the~~ output ~~locus node~~ and ~~said the~~ diode-connected transistor, ~~said the~~ diode-connected transistor is between ~~said the~~ first resistor and ~~said the~~ second resistor, and

~~said the~~ second resistor is between ~~said the~~ diode-connected transistor and ground, and (ii) ~~said the~~ input from a temperature responsive unit connects between ~~said the~~ diode-connected transistor and ~~said the~~ second resistor.

23. (Currently Amended) The amplifier of claim 21, wherein (i) ~~said the~~ diode-connected transistor is between ~~said the~~ output ~~locus node~~ and ~~said the~~ first resistor, first resistor is between ~~said the~~ diode-connected transistor and ~~said the~~ second resistor, and ~~said the~~ second resistor is between ~~said the~~ first resistor and ground, and (ii) ~~said the~~ input from a temperature responsive unit connects between ~~said the~~ first resistor and ~~said the~~ second resistor.

24. (Currently Amended) A multistage differential amplifier[[,]] comprising:

- (a) —a first amplifier stage, ~~said the~~ first amplifier stage including:
 - (i) —a first differential pair of input NPN bipolar transistors with loads coupled to a supply voltage through a first common-mode PMOS transistor; and
 - (ii) a first pair of emitter-follower output NPN bipolar transistors coupled to ~~said the~~ first differential pair of input transistors;
- (b) —a second amplifier stage, ~~said the~~ second amplifier stage including:
 - (i) —a second differential pair of input transistors with loads coupled to ~~said the~~ supply voltage through a second common-mode transistors; and
 - (ii) —a second pair of emitter-follower output transistors coupled to ~~said the~~ second differential pair of input transistors, wherein ~~said the~~ second differential pair of input transistors is coupled to ~~said the~~ first pair of emitter-follower output transistors; and
- (c) —a voltage regulator coupled to control ~~said the~~ first common-mode transistor, ~~said the~~ voltage regulator including:
 - (i) —a differential amplifier with a first input from a reference voltage, a second input from a temperature responsive unit, and an output to a third transistor connected between a supply voltage and ~~said the~~ temperature responsive unit; and
 - (ii) —a regulated voltage output ~~locus node~~ between ~~said the~~ third transistor and ~~said the~~ temperature responsive unit, wherein ~~said the~~ temperature responsive

unit includes in series a first resistor, a second resistor, and a diode-connected NPN bipolar transistor.

25. (Currently Amended) The amplifier of claim 24, wherein ~~said~~the voltage regulator is coupled to control ~~said~~the second common-mode transistor.

26. (Currently Amended) The amplifier of claim 25, further comprising: ~~(a)~~—a third amplifier stage, ~~said~~the third amplifier stage including:

(i)—a third differential pair of input transistors with loads coupled to ~~said~~the supply voltage through a third common-mode transistor; and

(ii)—a third pair of emitter-follower output transistors coupled to ~~said~~the third differential pair of input transistors, wherein ~~said~~the third differential pair of input transistors is coupled to ~~said~~the second pair of emitter-follower output transistors.

27. (Currently Amended) The amplifier of claim 21, wherein ~~said~~the voltage regulator is coupled to control ~~said~~the second common-mode transistor~~[[;]]~~, and wherein the diode-connected transistor has a voltage-temperature response similar to that of each of the second pair of emitter-follower output transistors in the second amplifier stage.

28. (Currently Amended) The amplifier of claim 27, further comprising: ~~(a)~~—a third amplifier stage, ~~said~~the third amplifier stage including:

(i)—a third differential pair of input transistors with loads coupled to ~~said~~the supply voltage through a third common-mode transistor; and

(ii)—a third pair of emitter-follower output transistors coupled to ~~said~~the third differential pair of input transistors, wherein ~~said~~the third differential pair of input transistors is coupled to ~~said~~the second pair of emitter-follower output transistors.